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Pesticide Fact Sheet Number 2: Cryolite

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16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, Science Findings

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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Office of Pesticide Programs (TS-768C)
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EPA

Pesticide Fact Sheet

Name of Chemical: CRYOLITE
Reason for Issuance:
Date Issued: June 30, 1983
Fact Sheet Number: 2

1. Description of Chemical

Generic name: Sodium fluoaluminate or sodium aluminofluoride
Common name: Cryolite (natural or synthetic)
Trade name: Kryocide
EPA Shaughnessy code: 075101
Chemical Abstracts Service (CAS) number: 15096-52-3 or 1344-75-8
Year of initial registration: about 1967
Pesticide type: insecticide
Chemical family: aluminofluoride salt
U.S. and foreign producer: Pennwalt Corporation

2. Use Patterns and Formulations

Application sites: domestic and non-domestic terrestrial food crops and ornamentals
Types of formulations: wettable powder, dusts
Types and methods of application: aerial or ground application as a spray or dust
Application rates: varies from 6 to 50 lbs./acre
Usual carriers: Confidential Business Information

3. Science Findings

Summary science statement:

Based on data reviewed for the Cryolite Standard, cryolite exhibits low to moderate toxicity to humans (toxicity category III-IV), fish and wildlife.

However, since a number of toxicology and residue data gaps exist, the Agency is unable to complete a risk assessment.

Chemical characteristics:

Technical grade cryolite may be the naturally occuring fluoride of sodium and aluminum called "natural cryolite" or it may be the manufactured material of similar composition called "synthetic cryolite". Both forms are a solid with melting points of 1000°C for the synthetic and 1009°C for the natural cryolite. Natural cryolite may be white, black, purple or violet. The synthetic cryolite is white. Cryolite is completely stable under normal storage conditions. The are no unusual handling characteristics.

Toxicology characteristics:

No toxicological hazards of concern have been identified based on the studies reviewed for the standard.

- Acute dermal LD_{50}, rabbit: >2.1 g/kg (Tox category III)
- Acute inhalation LD_{50}: <5.03 mg/L, 2.06 mg/L (Tox category III)

- Primary dermal irritation, rabbit: P.I. score = 0.0, not an irritant (Tox category IV)
- Primary eye irritation, rabbit: moderate conjunctival irritation that disappeared within 7 days (Tox category III)

A sequential testing approach is being applied to this compound because the chemical properties are unique. Therefore, after review of the studies required under the standard (a 90-day feeding study in the rat and the dog), additional subchronic and chronic studies may be required.

Physiological and Biochemical Behaviorial Characteristics:

Mechanism of pesticidal action: stomach poison
Mechanism and persistence in plants and animals: Not known

Environmental Characteristics:

There are no available data on cryolite. However, based on the chemical and physical characteristics, none of the usual environmental fate data normally required would yield useful information, with the exception of hydrolysis and leaching studies which are required under the standard.

Ecological Characteristics:

Based on current data, cryolite has been determined to be practically non-toxic to bobwhite quail and mallard ducks in subacute doses; however, hazards to birds, fish and aquatic invertebtrates may be greater that previously supposed. Additional data are required to address this concern.

- Dietary LC_{50} (mallard duck and bobwhite quail): >10,000 ppm (practically nontoxic)
- Freshwater invertebrates LC_{50} (Daphnia pulex): 10 ppm (moderately toxic)
- Fish acute LC_{50} (rainbow trout): 47 ppm (slightly toxic)
- Fish acute LC_{50} (bluegill sunfish): >300 ppm (practically nontoxic)

Efficacy review results:
No efficacy data required.

Tolerance Assessments:

Tolerances have been established (40 CFR 180.145) of 7 ppm of combined fluorine for residues of the insecticidal fluorine compounds cryolite and synthetic cryolite in or on each of the following raw agricultural commodities: Apples, apricots, beans, beets (with or without tops) or beet greens alone, blackberries, blueberries (huckleberries), boysenberries, broccoli, brussels sprouts, cabbage, carrots, cauliflower, citrus fruits, corn, collards, cranberries, eggplants, grapes, kale, kohlrabi, lettuce, loganberries, melons, mustard greens, nectarines, okra, peaches, peanuts, pears, peas, peppers, plums (fresh prunes), pumpkins, quinces, radishes (with or without tops) or radish tops, raspberries, rutabagas (with or without tops) or rutabaga tops, squash, strawberries, summer squash, tomatoes, turnips (with or without tops) or turnip greens, youngberries.

Specific residue data are being required on a number of crops. The Agency will assess all cryolite tolerances after the necessary toxicity and residue data are received. Residue data are required to ascertain the need for food additive tolerances for the following processed commodities: Apple pomace (wet and dry), apple juice, bean cannery waste, citrus (peel, oil, dried pulp and molasses), corn (oil and milled fractions), mustard seed, tomato pomace (wet and dry, juice, puree, catsup).

Livestock feeding studies are required to ascertain the extent of carryover (if any) into meat, milk, poultry and eggs, and the need to establish tolerances for these commodities.

4. Summary of Regulatory Position and Rationale

Use classification: not classified
Use restrictions: none
Unique warning statements: none

No toxicological hazards of concern have been identified in the studies reviewed for this standard. However, since a number of toxicology and residue data gaps exist, the Agency is unable to complete a risk assessment of cryolite.

5. Summary of Major Data Gaps

Product chemistry: most of these data are lacking for the natural cryolite. Data to be submitted by December, 1983.

Residue chemistry: residue data are lacking on all crops for which tolerances are established with the exception of grapes. Further, there are no data available on the processing of commodities other than raisins. Livestock feeding studies are required to ascertain the extent of carryover (if any) into meat, milk, poultry and eggs. Data must be submitted by June, 1986.

Toxicology: oral LD_{50} (rat), dermal sensitization, 90-day feeding (rat and dog), mutagenicity studies. Chronic studies may be required following receipt and evaluation of acute, subchronic, and residue data. Data must be submitted by December, 1983.

Environmental fate: hydrolysis and leaching studies. Data must be submitted by June, 1986.

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